

**The Claims Defining the Invention are as Follows****1. An isolated polypeptide comprising:**

- (i) an amino acid sequence selected from the group consisting of SEQ ID NO:2 to SEQ ID NO:22;
- (ii) an amino acid sequence which is at least 60% homologous to an amino acid sequence from (i);
- (iii) an amino acid sequence which is at least 80% identical to an amino acid sequence from (i); or
- (iv) a fragment of any of (i) to (iii) with a biological activity of the polypeptide encoded by SEQ ID NO:2.

**2. An isolated polynucleotide comprising:**

- (i) a nucleotide sequence encoding a polypeptide according to claim 1;
- (ii) the nucleotide sequence set out in SEQ ID NO:1;
- (iii) a nucleotide sequence corresponding to a degenerate version of the sequences defined in (i) or (ii);
- (iv) a nucleotide sequence capable of selectively hybridising to the sequences in (i) to (iii);
- (v) a nucleotide sequence complementary to any of the sequences (i) to (iv).
- (vi) a fragment of the sequence in (v) suitable for use as a primer or probe.

**3. A method for preparing a polypeptide according to claim 1 comprising the steps of:**

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- (i) culturing a cell comprising a polynucleotide according to claim 2 (i) to (iv) operably linked to a promoter, under conditions that provide for expression of the polypeptide; and
  - (ii) recovering the expressed polypeptide.
- 4. The method of claim 3 wherein the polypeptide is recovered using chromatography.
- 5. The method of claim 4 wherein the chromatography comprises the use of a Ni-chelation column and/or gel filtration.
- 6. A vector comprising a nucleotide sequence according to claim 2.
- 7. A host cell transformed or transfected with the vector according to claim 6.
- 8. An antibody specific for an amino acid sequence according to claim 1.
- 9. An antibody according to claim 8 further comprising a detectable label.
- 10. A method of preparing an antibody comprising the steps of:
  - (i) conjugating a polypeptide according to claim 1 to a carrier protein;
  - (ii) administering the conjugate of (i) and an adjuvant to an animal; and
  - (iii) isolating the resulting antibody from the animal.
- 11. A method of screening a sample for *Brachyspira* species, including but not limited to *B. hyodysenteriae*, *B. intermedia*, *B. alvinipulli*, *B. aalborgi* and *B. pilosicoli* comprising the steps of:
  - (i) contact the sample with a polynucleotide according to claim 2 (vi) under suitable hybridising conditions; and
  - (ii) detecting any duplexes formed between the polynucleotide and nucleotide sequences in the sample.
- 12. A method according to claim 11 wherein the polynucleotide is selected from the group consisting of SEQ ID NO: 24, and SEQ ID NOs: 27 to 37.

13. A method of screening a sample for a polypeptide according to claim 1 comprising:
- (i) contacting the sample with an antibody according to claim 8 under conditions which allow for the formation of a reaction complex; and
  - (ii) detecting the reaction complex.
14. A method of screening a sample for an antibody according to claim 8 comprising the steps:
- (i) contacting the sample with a polypeptide according to claim 1 under conditions which allow for the formation of a reaction complex; and
  - (ii) detecting said reaction complex.
15. A kit for screening a sample for *Brachyspira* species, including but not limited to *B. hyodysenteriae*, *B. intermedia*, *B. alvinipulli*, *B. aalborgi* and *B. pilosicoli* comprising:
- (i) a polynucleotide according to claim 2 (vi); and
  - (ii) means for detecting any duplexes formed between the polynucleotide and nucleotide sequences in the sample.
16. A kit for screening a sample for a polypeptide according to claim 1 comprising:
- (i) an antibody according to claim 8;
  - (ii) means for detecting a reaction complex comprising the antibody.
17. A kit for screening a sample for an antibody according to claim 8 comprising:
- (i) a polypeptide according to claim 1; and
  - (ii) means for detecting a reaction complex comprising the polypeptide.
18. A method of treating a disease associated with *Brachyspira* species, including but not limited to *B. hyodysenteriae*, *B. intermedia*, *B. alvinipulli*, *B. aalborgi* and *B. pilosicoli* in an animal comprising administering to the animal an effective amount of a composition selected from the group consisting of:

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- (i) a composition comprising a polynucleotide sequence according to claim 2 (i) to (iv) in a form adapted to result in the expression of the polypeptide encoded by the polynucleotide;
- (ii) a polypeptide according to claim 1; or
- (iii) (i) or (ii) together with an adjuvant.

19. A method of treating a disease associated with *Brachyspira* species, including but not limited to *B. hyodysenteriae*, *B. intermedia*, *B. alvinipulli*, *B. aalborgi* and *B. pilosicoli* in an animal comprising administering to the animal an effective amount of a composition comprising a polynucleotide according to claim 2 (v).

20. A method of treating a disease according to claim 18 or 19 wherein the disease is intestinal spirochaetosis.

21. A method of immunising an animal against a disease associated with *Brachyspira* species, including but not limited to *B. hyodysenteriae*, *B. intermedia*, *B. alvinipulli*, *B. aalborgi* and *B. pilosicoli* comprising the step of administering an immunogenic amount of a composition selected from the group consisting of:

- (i) a composition comprising a polynucleotide sequence according to claim 2 (i) to (iv) in a form adapted to result in the expression of the polypeptide encoded by the polynucleotide;
- (ii) a polypeptide according to claim 1; or
- (iii) (i) or (ii) together with an adjuvant.

22. A method according to claim 21 wherein the disease is intestinal spirochaetosis.

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23. A method according to any one of claims 18 to 22 wherein the animal is selected from the group consisting of: pigs, chickens, dogs, horses, cattle, sheep, fish, and humans.
24. A composition comprising a carrier and: (i) a polypeptide according to claim 1; (ii) a polynucleotide according to claim 2; or (iii) an antibody according to claim 8.
25. A kit for screening for comprising at least a polynucleotide complementary to a portion of the Bpmp-72 encoding polynucleotide sequence, a suitable container and instructions for its use.
26. The use of a polynucleotide according to claim 2 or a polypeptide according to claim 2 for the manufacture of a medicament for treating or preventing a disease associated with *Brachyspira* species, including but not limited to *B. hyodysenteriae*, *B. intermedia*, *B. alvinipulli*, *B. aalborgi* and *B. pilosicoli*.